

[54] ARCHERY BOW HAVING VIBRATION DAMPENER

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[58] Field of Search .... 124/30 R, 23, 24, 124/25; 248/358 R; 267/136

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[57]

ABSTRACT

An archery bow being provided with at least one pair of stabilizers or vibration dampeners each of which comprises a vibrator, such as a rod member with a weight mounted at the free end thereof. The vibrator extends over the limb section of the archery bow, and is directly connected to the limb section through an elastic member, such as a coil spring. The vibrator is also connected to the bow at another location on the bow. The shock and vibration caused by the limb section is directly and immediately transmitted to the vibrator through the elastic member, and is effectively absorbed by the vibrator. The elastic member prevents the shock or vibration that is once transmitted from the limb section to the vibrator to be fed back to the limb section.

8 Claims, 5 Drawing Figures

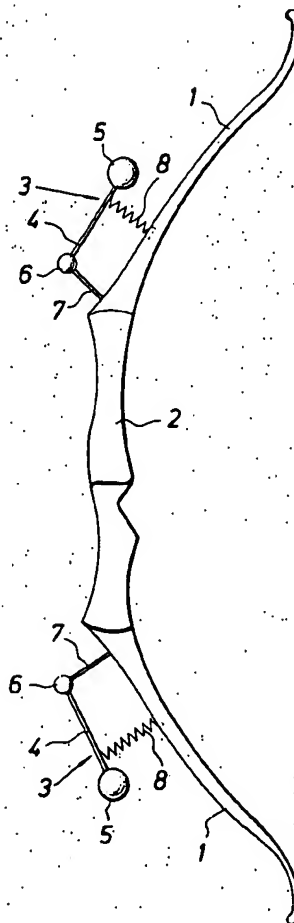


Fig. 1

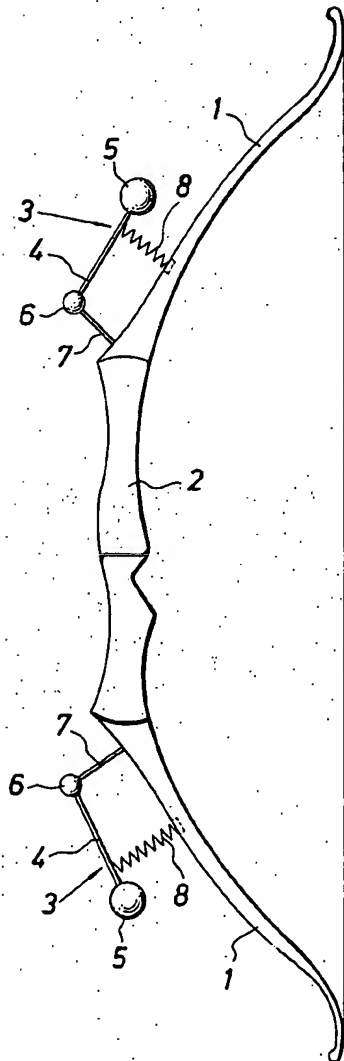
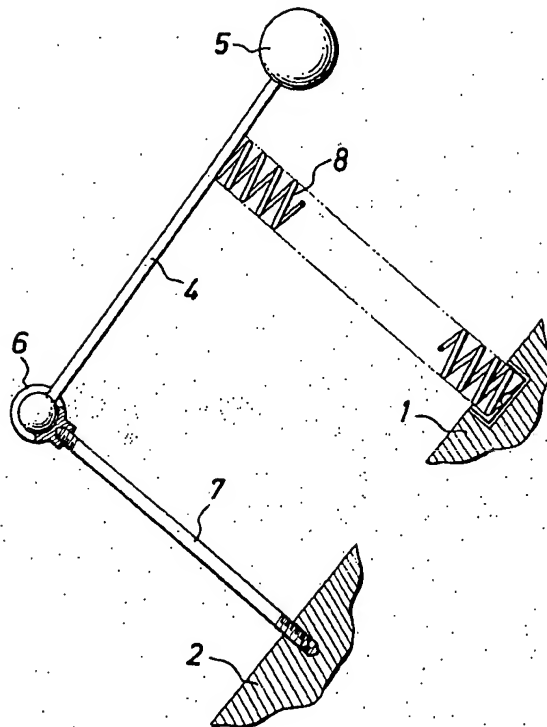


Fig. 2



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Fig. 3

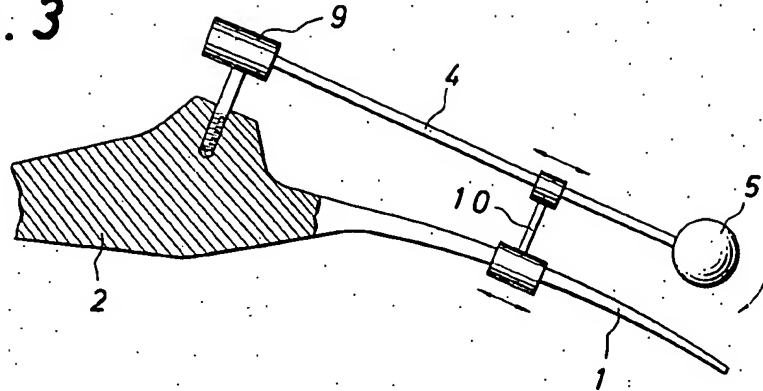


Fig. 4

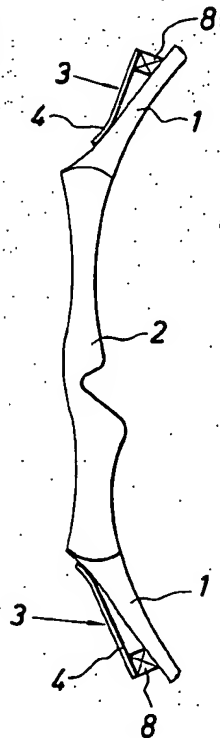
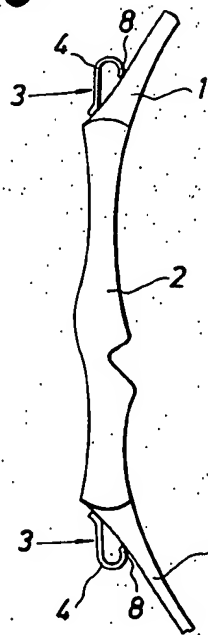


Fig. 5



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## ARCHERY BOW HAVING VIBRATION DAMPENER

### BACKGROUND OF THE INVENTION

This invention relates to an archery bow which is provided with at least a pair of stabilizers acting on the limb sections.

In a conventional archery bow, a vibration or shock being caused in the handle section (rigid center section) is absorbed or reduced by one or more stabilizers each consisting of a vibratory rod member with a weight connected at the free end thereof. Such stabilizers are usually attached to the handle section of an archery bow. This vibration or shock in the handle section is propagated from the limb sections, and is created by quick recoveries of the limb sections and the string to their original positions when the arrow is released after full drawing. Such vibration or shock is not a definite one but differs due to the natural vibration of the bow body as well as due to each strength of recovery of the limb sections and the string of the archery bow to their original position. In conventional structures of stabilizers, a vibration or shock is absorbed or reduced only by means of the vibration of the vibratory rod, and therefore, the amplitude of the vibration is a definite one and it is impossible to regulate the amplitude of vibration to cope with the natural vibration of the bow body. As further demerits of the conventional stabilizer for an archery bow, the absorption or reduction of the vibration or shock is slow since the absorption or reduction comes into effect after the vibration or shock is propagated into the handle section, to which the stabilizers are attached.

### SUMMARY OF THE INVENTION

The principal object of the present invention is to provide an archery bow having stabilizers in which a vibration or shock which is brought about in the limb sections is absorbed or reduced in each limb section before it is propagated into the handle section, the absorption or reduction of the vibration or shock being carried out desirably by means of stabilizers each comprising a vibrator extending over the limb section, and an elastic member attached between the vibrator and each limb section.

Other objects, features and advantages of the present invention will be apparent from the following description, taken in connection with the accompanying drawings, in which the figures show several embodiments of the invention. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not designed as a definition of the invention, reference being had for this purpose to the appended claims.

### BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a side view of an archery bow having stabilizers of the first embodiment of the present invention; FIG. 2 is a fragmentary side view partly in section of the stabilizer shown in FIG. 1;

FIG. 3 is a fragmentary side view partly in cross section of an archery bow having a stabilizer embodying the second embodiment of the present invention; and

FIG. 4, and FIG. 5 are fragmentary side views of archery bows, respectively showing the third and fourth embodiments of the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the drawings, numerals 1, 1 designate limb sections extending from the upper and lower ends of the handle section 2 of an archery bow. Stabilizers 3, 3 are supported over the respective limb sections 1, 1.

In the first embodiment of the invention shown in FIGS. 1 and 2, each stabilizer 3 is composed of a rod vibrator 4 having a weight 5 such as a metal ball at the top free end thereof. The other end of the vibrator 4 is connected through a universal joint 6 to a rod support 7 attached to the coupling portion of the handle and limb sections. A coil spring 8 is disposed between the rod vibrator 4 and the limb section 1 of the archery bow. That is, one end of the coil spring 8 is connected to that portion of the rod vibrator 4 near the weight 5, and the other end thereof is connected to the limb section 1.

In the archery bow provided with the stabilizer 3 of above described construction, the elastic member 8 expands and contracts due to the back-and-forth vibration of the limb section 1, and this back-and-forth vibration of the limb section 1 is mostly transmitted to the vibrator 4 through the coil spring 8, although it is partly transmitted through the rod support 7. Consequently, the vibrator 4 vibrates back and forth, simultaneously causing the expansion and contraction of the elastic member 8. Accordingly, a vibration or shock in the limb section 1 is rapidly absorbed or reduced by the elastic movement of the elastic member 8 and the vibration of the vibrator 4, and a slight vibration or shock propagated in the handle section is also absorbed or reduced by the vibration of the vibrator 4. The elastic coil spring 8 also acts to prevent the shock or vibration once transmitted to the vibrator 4 to be returned back to the limb section 1.

In the second embodiment of the present invention shown in FIG. 3, in the same way as the above-described first embodiment, the vibrator 4 having the weight 5 at the top free end thereof is located at the side of the limb section 1 by fixing the base end thereof to the interconnecting portion of the limb section 1 and the handle section 2 through an elastic damper 9, and the vibrator 4 is connected by an interconnecting member 10 at a position near the weight 5. Both ends of the interconnecting member 10 are slidably fitted to the rod vibrator 4 and the limb section 1, respectively, by the frictional engagement therewith. Accordingly, the interconnecting member 10 can be forcedly shifted along the vibrator and limb section. In the above described construction, the vibration or shock caused by the limb section is transmitted to the vibrator 4 through the interconnecting member 10, and accordingly the vibrator vibrates, thus absorbing and reducing the vibration or shock in the limb section. The damper 9 helps the vibrator 4 to vibrate more effectively. Moreover, the amplitude of vibration of the vibrator 4 can be varied according to the varied positioning of the interconnecting member 10, and therefore the vibration can be regulated at archer's will by sliding the interconnecting member 10 along the vibrator and limb section. This interconnecting member 10 further contributes to the regulation of the bending strength of the limb section 1.

In the third embodiment of the invention shown in FIG. 4, the vibrator 4 is made of a plate spring. The

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base end of the plate spring 4 is fitted to the coupling portion of the limb section 1 and the handle section 2. An elastic member 8 such as of rubber cushion is interposed between the free end of the vibrator 4 and the limb section 1, so that it connects therebetween, and shock in the limb 1 is transmitted to the vibrator 4 through the elastic member 8 and absorbed or reduced by means of said vibrator 4 vibrating together with the elastic member 8.

Lastly, in the fourth embodiment of the invention shown in FIG. 5, the vibrator 4 consisting of a plate spring is made integrally with an elastic member 8, wherein the free end portion of the vibrator 4 is curved toward the limb section 1, so that the curved end portion elastically thrusts the limb section 1, causing an elastic action between the vibrator 4 and the limb section 1. This construction also permits the vibration or shock caused by the limb section to be transmitted to the vibrator 4 through the curved elastic member 8.

As described above, according to the present invention, a vibration or shock can be absorbed or reduced instantly in the limb sections of an archery bow, and therefore, the archery bow of this invention is more effective than the conventional ones, in which the vibration or shock is absorbed or reduced through the bow body. The bow of the present invention can further attain a superior stabilizing effect, since it enables the effective length of the vibrator to be regulated at will.

What is claimed is:

1. An archery bow having a handle section; limb sections extending from said handle section at both ends thereof; and at least one pair of stabilizers each comprising an elongated vibrating member extending over one of said limb sections, means for elastically supporting said vibrating member, said elastically supporting means being connected with said vibrating member

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near one end of said vibrating member and also being connected with said one limb section; said vibrating member being directly connected near its other end to said one limb section, at a position spaced from the connection to the bow for said one end, near the other end of said vibrating member.

2. The archery bow as claimed in claim 1, wherein said vibrating member is formed into a rod member with a free end, and is provided with a weight at the free end thereof.

3. The archery bow as claimed in claim 1, wherein said bow has a connecting portion between said handle and said limb sections and said vibrating member is attached to said connecting portion of said handle and limb sections.

4. The archery bow as claimed in claim 1, wherein said elastically supporting means is a coil spring.

5. The archery bow as claimed in claim 1, wherein said vibrating member is connected with said one limb section near said vibrating member's other end by a coupling, said coupling member is frictionally engaged with said vibrating member and said one limb section so that it can be slidable along said vibrating member and said one limb section.

6. The archery bow as claimed in claim 1, wherein said vibrating member is a plate spring, and said elastically supporting means is a rubber cushion.

7. The archery bow as claimed in claim 1, wherein said elastically supporting means is integrally with said vibrating member and is curved toward said one limb section so as to provide a thrusting force to said one limb section.

8. The archery bow as claimed in claim 7, wherein said vibrating member is a plate spring.

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